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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/072,357	02/06/2002	Michael D. Kilgore	M-11543 US	4288

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David E. Steuber
SKJERVEN MORRILL MacPHERSON LLP
Suite 700
25 Metro Drive
San Jose, CA 95110-1349

EXAMINER
GUERRERO, MARIA F

ART UNIT	PAPER NUMBER
2822	

DATE MAILED: 07/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/072,357	Applicant(s) KILGORE, MICHAEL D.	
	Examiner Maria Guerrero	Art Unit 2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 February 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. This Office Action is the First Action on the merits.

Claims 1-20 are pending.

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-11, 15-17, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwan et al. (U.S. 6,335,288).

4. Kwan et al. teaches inserting a wafer into a reaction chamber, performing a plasma process on the wafer at a process temperature, cooling the wafer to a second temperature less than the process temperature, and removing the wafer from the reaction chamber (Fig. 1D, 3, col. 13, lines 47-67, col. 14, lines 5-10, 30-40, 50-55). Kwan et al. discloses the process temperature being greater than 400°C, the second temperature being less than 250°C or less than 150°C (col. 14, lines 23-40). In addition,

Kwan et al. teaches the process being a plasma deposition of silicon dioxide for trench isolation and plasma deposition of fluorine doped silicon dioxide (Fig. 2, col. 1-10, col. 15, lines 5-25, col. 16, lines 35-36).

Kwan et al. does not specifically show the second temperature being the removal temperature and the specific temperature as claimed. However, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to specify the removal temperature in reference by routine experimentation. The modification would provide a combination of deposition and etching process without affecting the material already in the substrate (col. 2, lines 60-67).

5. Claims 14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwan et al. (U.S. 6,335,288) in view of Chang et al. (U.S. 6,143,579) (cited by Applicant).

Regarding claims 14 and 18, Kwan et al. does not specifically show etching a photoresist and the wafer having a gate dielectric layer. However, Chang et al. teaches etching a photoresist and the wafer having a gate dielectric layer (col. 5, lines 28-30, 50-55).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Kwan et al. reference by including the steps of etching

the photoresist and forming the gate dielectric layer as taught Chang et al. because Kwan et al. suggested that other variations are included within the scope of this invention (Kwan et al., col. 15, lines 13-27).

6. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwan et al. (U.S. 6,335,288) in view of Wang et al. (U.S. 6,268,274).

Regarding claims 12-13, Kwan et al. does not specifically show depositing a phosphorous-doped silicon dioxide layer. However, Wang et al. shows a plasma process to deposit a phosphorous-doped silicon dioxide layer (col. 6, lines 30-40).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Kwan et al. reference by including phosphorous-doped silicon dioxide layer as taught Wang et al. because Kwan et al. suggested that different precursors can be used to form films of different composition (Kwan et al., col. 15, lines 15-25).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chen et al. (U.S. 6,551,946), Roy (U.S. 5,132,244), Lojek et al. (U.S. 5,851,892), Tsubone et al. (U.S. 5,673,750) teach the steps of inserting, processing, cooling and removing as conventional in the art. Moslehi (U.S. 5,436,172) and Chern et al. (U.S. 5,834,068) show controlling the wafer temperature. Li et al. "Gate Oxide Damage Reduction and Antenna Yield Improvement Using Low temperature Preclean for Sub-o.25 microns Metallization" teaches improving the antenna yield by reducing gate oxide damage.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is 703-305-0162.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

María Guerrero
Maria Guerrero
Patent Examiner
June 30, 2003